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International conference on human biomonitoring, Berlin 2010

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This focus issue assembles publications on the issues presented and discussed at the two-day international conference “Human Biomonitoring: Political benefits – scientific challenges” held in Berlin on September 26–28, 2010. The major aim of this conference was to bring together the broad variety of human biomonitoring (HBM) activities conducted worldwide to present a clear picture of HBM's use in science and regulation. The conference was jointly organized by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and the German Federal Environment Agency (UBA) to elucidate and describe the scientific challenges as well as the political benefits of HBM. The global dimension of HBM was illustrated by contributions from HBM activities in Asia, Africa, North and South America, and Europe, and the participation of experts from 36 countries.

HBM studies investigate human exposure to environmental chemicals and their potentially harmful impacts on public health. HBM informs environment and health policy by providing scientific data on: (a) which substances are absorbed by the human body, (b) the exposure levels, (c) whether certain groups of the population are particularly affected, and (d) whether chemical policy regulations have led to the intended decrease in exposure. Based on these assumptions the conference participants were invited to:

- examine the strengths and limitations of HBM in the detection and assessment of human exposures,
- take a critical look at which substances should be examined as a matter of priority and the health impacts that may be expected from chemical exposure, and

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- discuss the incorporation of HBM into national and international initiatives on environmental health.

The conference opened with a discussion by a panel of stake-holders on the strengths and limitations of HBM. The scientific conference agenda consisted of five sessions: (1) lessons learned from existing programs; (2) future challenges and emerging programs; (3) HBM and health effects; (4) risk assessment of HBM data; and (5) going global – Do we need global HBM? The conference concluded with a panel discussion on the political dimension of HBM.

Expert speakers from nearly all parts of the world confirmed, with their extensive studies, that HBM is a useful tool for detecting human exposure to industrial chemicals, as well as to natural substances. The conference demonstrated the significant growth in knowledge of environmental chemical exposure in humans and the related health impacts. This growing knowledge requires scientists and regulators from all over the world to address public concerns and to take appropriate actions.

Chemical priorities for HBM vary from country-to-country and region-to-region due to differences in current chemical usage, exposure levels and regulation status. For example, in Europe the focus has changed from substances such as lead and cadmium to second- and third-generation plasticizers and flame retardants. In Asia and Africa, the emphasis is currently on substances including dichlorodiphenyltrichloroethane (DDT), polychlorinated biphenyls (PCBs) and lead, many of which have long been banned or are subject to severe use restrictions in Europe, North America and elsewhere. Thus, HBM data show that some products remain in use in certain countries despite having been banned in others. Some of these substances may be present due to their persistence in the environment and global distribution. As new substances are constantly being introduced, there is a need to expand the range of substances that can be measured by HBM to keep pace with chemical product innovation. Development of new analytical methods for emerging substances and their inclusion in future HBM studies is one of the challenges ahead. Establishing specimen biobanks will provide a useful resource for future reference and analyses. Today's substances might be tomorrow's challenges.

The HBM conference illustrated the need to promote harmonized criteria, procedures and tools for the interpretation of HBM data and the enhancement of their use in human health risk assessment. Toxicological information required for developing these tools is becoming increasingly available through regulatory requirements such as those under the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) regulation and similar initiatives in other countries.

HBM provides scientific data to inform decision making by regulators, policy makers, and the general public. On the regulatory and policy side, HBM provides a mechanism for monitoring the success of policies in reducing exposure to environmental chemicals and for identifying areas for priority action. Approaches for communicating HBM results to the various users require further improvement.

BMU and UBA, the organizers of the HBM conference, sincerely thank all authors and conference participants for their valuable contributions. We also want to gratefully recognize the work of the scientific committee for putting together an interesting programme and ensuring the high quality of the conference and the importance of its outcomes. Special thanks are due to the following additional members of the scientific committee:

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